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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/588,218

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Shigeru Ogino

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EXAMINER

BEST, ZACHARY P

ART UNIT

PAPER NUMBER

1795

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/588,218	Applicant(s) OGINO ET AL.	
	Examiner Zachary Best	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 November 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) 10-16 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 August 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>08022006, 09272007</u> . | 6) <input type="checkbox"/> Other: _____ |

FUEL CELL SYSTEM

Examiner: Z. Best S.N. 10/588,218 Art Unit: 1795 January 8, 2009

Election/Restrictions

1. Applicant's election with traverse of Claims 1-9 in the reply filed on November 5, 2008 is acknowledged. The traversal is on the ground(s) that there is no serious burden. This is not found persuasive because regardless of search method, the inventions of different limitations will require different search strategies, and the time and effort to consider the relevancy of the collective references would increase proportionally resulting in a serious burden to Examiner. Claims 10-16 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected inventions, there being no allowable generic or linking claim. The requirement is still deemed proper and is therefore made FINAL.

Specification

2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The term "predetermined" in Claims 1, 4, 6, and 8 is a relative term which renders the claim indefinite. The term "predetermined" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-2, 5, and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Makihara et al. (JP 05-299105 A).

Regarding Claim 1, Makihara et al. teach a fuel cell system (abstract) comprising a fuel cell (01) having an electrolyte (11), a cathode on one side of the electrolyte (par. 16, drawing 1), an anode with a hydrogen permeable metal layer (14) provided on the other side of the electrolyte (par. 16, drawing 1), a cathode channel for supplying oxidizing gas to the cathode (21), an anode channel for supplying fuel gas containing hydrogen to the anode (18). While Makihara et al. does not explicitly teach a hydrogen permeable metal layer degradation prevention section configured to reduce partial pressure of hydrogen in the anode channel, a

temperature parameter acquisition section configured to acquire temperature of the hydrogen permeable metal layer, and a fuel cell controller that operates the permeable metal layer degradation prevention section in response to temperature deviation, Makihara et al. teach that the partial pressure of the hydrogen in the anode channel must be controlled and monitored (pars. 36-38), the temperature of the hydrogen permeable metal layer must be controlled and monitored (pars. 35-36), and the temperature is dependent in the partial pressure (pars. 35-38). Therefore, the hydrogen permeable metal layer degradation prevention section configured to reduce partial pressure of hydrogen in the anode channel, temperature parameter acquisition section configured to acquire temperature of the hydrogen permeable metal layer, and fuel cell controller that operates the permeable metal layer degradation prevention section in response to temperature deviation would be inherent. A reference that is silent about a claimed invention's features is inherently anticipatory if the missing feature is necessarily present in that which is described in the reference. *In Re Roberston* 49 USPQ2d 1949 (1999).

Regarding Claims 2 and 5, Makihara et al. teach that the partial pressure of hydrogen in the anode channel is controlled (pars. 34-38). A reference that is silent about a claimed invention's features is inherently anticipatory if the missing feature is necessarily present in that which is described in the reference. *In Re Roberston* 49 USPQ2d 1949 (1999).

Regarding Claims 9, Makihara et al. teach the fuel cell system comprises a reformer (par. 8), and the reformer and hydrogen permeable metal layer system operates simultaneously (pars. 17-18 and 34-38).

Claim Rejections - 35 USC § 103

7. Claims 3-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Makihara et al. as applied to Claims 1-2, 5 and 9 above, and further in view of Aoyama et al. (JP 2001-223017 A).

Regarding Claim 3, Makihara et al. teach the fuel cell system as recited in paragraph 6 above. However, Makihara et al. do not teach a hydrogen separating device separating hydrogen in fuel gas, and a hydrogen concentration reduction section configured to reduce a partial pressure of hydrogen in the anode channel by supplying fuel gas whose hydrogen concentration has been decreased by the hydrogen separation device to the anode channel.

Aoyama et al. teach a fuel cell system with a hydrogen separation membrane (hydrogen separating device, 18), which decreases the partial pressure of hydrogen in order to improve the separation efficiency of hydrogen (abstract). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to create the fuel cell system of Makihara et al. with the hydrogen separation membrane and separation part of Aoyama et al. because Aoyama et al. teach the partial pressure may be controlled and the hydrogen separation efficiency is improved.

Regarding Claim 4, Aoyama teach a gas supply reduction section for decreasing partial pressure of hydrogen in the anode channel (abstract), and Makihara et al. teach the operating temperature of the hydrogen permeable metal layer (par. 36), and the partial pressure parameters of the system in regards to the metal layer, wherein the partial pressure

is dependent on the operating temperature, and vice versa (pars. 34-38). Therefore, a temperature changing facilitation section with controller would be inherent in order to maintain the necessary operating parameters as taught by Makihara et al. A reference which is silent about a claimed invention's features is inherently anticipatory if the missing feature is necessarily present in that which is described in the reference. *In re Robertson*, 49 USPQ2d 1949 (1999). Alternatively, it would have been obvious to one skilled in the art at the time the invention was made to include a temperature changing facilitation section and controller in order to maintain the necessary hydrogen partial pressure at the hydrogen permeable metal layer because Makihara et al. teach that the partial pressure is dependent on the operating temperature (pars. 34-38). Discovery of an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272 (CCPA 1980).

8. Claims 6 and 8 are rejected under 35 U.S.C. 103(a) as obvious over Makihara et al., as applied to Claims 1-2, 5, and 9 above.

Regarding Claims 6 and 8, Makihara et al. teach the operating temperature of the hydrogen permeable metal layer (par. 36), and the partial pressure parameters of the system in regards to the metal layer, wherein the partial pressure is dependent on the operating temperature, and vice versa (pars. 34-38). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to include a temperature changing facilitation section and controller in order to maintain the necessary hydrogen partial pressure at the hydrogen permeable metal layer because Makihara et al. teach that the partial

pressure is dependent on the operating temperature and the temperature and partial pressure parameters must be controlled within a specified range (pars. 34-38).

9. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Makihara et al. as applied to Claims 1-2, 5-6 and 8-9 above, and further in view of Standke et al. (US 7,261,960 B2).

Regarding Claim 7, Makihara et al. teach the fuel cell system as recited in paragraph 6 above. However, Makihara et al. do not teach a heating channel, which is a gas channel for which an oxidizing catalyst is provided, and the temperature increase facilitation section includes a hydrogen permeable layer heating section configured to heat the hydrogen permeable metal layer by supplying gas including a combustible component and an oxidizing component to the heating channel.

Standke et al. teach a fuel cell with a heat exchange plate (heating channel), wherein the heating exchange plate is in a heating exchange relationship with the active layers, and the heating exchange plate is a gas channel containing an catalyst layer, wherein hydrogen (combustible component) is oxidized to release heat (abstract). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to create the fuel cell system of Makihara et al. having the heat exchange plate wherein the heating exchange plate is in a heating exchange relationship with the active layers, and the heating exchange plate comprises a gas channel containing an catalyst layer, wherein

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hydrogen (combustible component) is oxidized to release heat in order to maintain fuel cell component operating temperatures (col. 1, lines 6-8).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Zachary Best whose telephone number is (571) 270-3963. The examiner can normally be reached on Monday to Thursday, 7:30 - 5:00 (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dah-Wei Yuan can be reached on (571) 272-1295. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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/Dah-Wei D. Yuan/
Supervisory Patent Examiner, Art Unit 1795